

Hardware Installation Guide for the Prosafe Stackable Smart Switch FS700TS Series

NETGEAR

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This is to declare that the NETGEAR Smart Fast Ethernet Switch with Gigabit Ports is compliant with EMC Directive 89/336/EEC and Low Voltage Directive 73/23/EEC. Conformity is declared by application of EN55022, Class A, EN55024 and EN60950.



Warning: This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take appropriate measures.

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This digital apparatus (NETGEAR Smart Fast Ethernet Switch with Gigabit Ports) do not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

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Cet appareil numérique (NETGEAR Smart Fast Ethernet Switch with Gigabit Ports) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Customer Support

Refer to the Support Information Card that shipped with your NETGEAR Prosafe Stackable Smart Switch.

World Wide Web

NETGEAR maintains a World Wide Web home page that you can access at the universal resource locator (URL) <http://www.netgear.com>. A direct connection to the Internet and a Web browser such as Internet Explorer or Netscape are required.

Product and Publication Details

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Chapter 1

About This Manual

This chapter describes the intended audience, scope, conventions, and formats of this manual.

Audience, Scope, Conventions, and Formats


This reference manual assumes that the reader has basic to intermediate computer and Internet skills. However, basic computer network, Internet, firewall, and VPN technologies tutorial information is provided in the Appendices and on the Netgear website.


This guide uses the following typographical conventions:


Table 1-1. Typographical Conventions

<i>italics</i>	Emphasis, books, CDs, URL names
bold	User input
<code>fixed</code>	Screen text, file and server names, extensions, commands, IP addresses

This guide uses the following formats to highlight special messages:

	Note: This format is used to highlight information of importance or special interest.
---	--

	Tip: This format is used to highlight a procedure that will save time or resources.
---	--

	Warning: Ignoring this type of note may result in a malfunction or damage to the equipment.
---	--



Danger: This is a safety warning. Failure to take heed of this notice may result in personal injury or death.

This manual is written for the Prosafe Smart Switch according to these specifications:

Table 1-2. Manual Scope






Product Version	NETGEAR Prosafe Stackable Smart Switch
Manual Publication Date	December 2005



Note: Product updates are available on the NETGEAR, Inc. Web site at <http://kbserver.netgear.com/products/FS7xxTS.asp>.

How to Use This Manual

The HTML version of this manual includes the following:

- Buttons,  and , for browsing forwards or backwards through the manual one page at a time
- A  button that displays the table of contents and an  button. Double-click on a link in the table of contents or index to navigate directly to where the topic is described in the manual.
- A  button to access the full NETGEAR, Inc. online knowledge base for the product model.
- Links to PDF versions of the full manual and individual chapters.

How to Print this Manual

To print this manual you can choose one of the following several options, according to your needs.

- Printing a Page in the HTML View.**

Each page in the HTML version of the manual is dedicated to a major topic. Use the *Print* button on the browser toolbar to print the page contents.

- **Printing a Chapter.**

Use the *PDF of This Chapter* link at the top left of any page.

- Click the *PDF of This Chapter* link at the top right of any page in the chapter you want to print. The PDF version of the chapter you were viewing opens in a browser window.
- Your computer must have the free Adobe Acrobat reader installed in order to view and print PDF files. The Acrobat reader is available on the Adobe Web site at <http://www.adobe.com>.
- Click the print icon in the upper left of the window.



Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

- **Printing the Full Manual.**

Use the *Complete PDF Manual* link at the top left of any page.

- Click the Complete PDF Manual link at the top left of any page in the manual. The PDF version of the complete manual opens in a browser window.
- Click the print icon in the upper left of the window.



Tip: If your printer supports printing two pages on a single sheet of paper, you can save paper and printer ink by selecting this feature.

Chapter 2

Introduction

Congratulations on the purchase of the NETGEAR Prosafe Stackable Smart Switch. The Prosafe Smart Switch is a state-of-the-art, high-performance, IEEE-compliant network solution designed for users who require a large number of ports and want the power of Gigabit connectivity to eliminate bottlenecks, boost performance, and increase productivity. To simplify installation, the switch is shipped ready for use out of the box.

This chapter serves as an introduction to the NETGEAR Prosafe Stackable Smart Switch and provides the following information:

- Overview
- Switch Features
- Package contents

Overview

This Installation Guide is for the following NETGEAR Prosafe Stackable Smart Switch models:

- FS728TS—supports 24 ports of 10/100 BASE-T, 2 ports of 10/100/1000 BASE-T, and 2 GbE combo (Copper/Fiber) ports
- FS752TS—supports 48 ports of 10/100 BASE-T, 2 ports of 10/100/1000 BASE-T, and 2 GbE combo (Copper/Fiber) ports
- FS752TPS PoE—supports 48 ports of 10/100 BASE-T, 2 ports of 10/100/1000 BASE-T, and 2 GbE combo (Copper/Fiber) ports. This model supports the added feature of Power over Ethernet (PoE).

These switches can be stacked together in a stack of up to six units, or a maximum of 192 10/100 ports, or can be used as stand-alone devices.

Using Gigabit ports, high-speed connections can be made to a server or network backbone. Application examples include:

- Connecting switches to each other with high-speed links
- Linking to high-speed servers
- Providing 10/100/1000 copper and fiber connectivity
- The 2 10/100/1000 Base T ports are primarily used for stacking, but can alternatively be used to provide additional bandwidth.

The NETGEAR Smart Switch also provides the benefit of administrative management with a complete package of features for the observation, configuration, and control of the network. With a Web-based Graphical User Interface (GUI), the switch's many capabilities can be viewed and used in a simple and intuitive manner. The switch's management features include configuration for port and switch information, VLAN for traffic control, port trunking for increased bandwidth, and Class of Service (CoS) for traffic prioritization. These features provide better understand and control of the network. Initial discovery of the switch on the network requires the Smart Wizard Discovery program, a utility that runs on a PC.

The NETGEAR Smart Switch can be free-standing, or rack mounted in a wiring closet or equipment room. It is IEEE-compliant and offers low latency for high-speed networking. All ports can automatically negotiate to the highest speed. This capability makes the switch ideal for environments that have a mix of Ethernet, Fast Ethernet, or Gigabit Ethernet devices. In addition, all RJ-45 ports operate in half- or full-duplex mode, increasing the maximum bandwidth of each connection up to either 20 Mbps, 200 Mbps, or 2000 Mbps respectively. The maximum segment length is 328 feet (100 meters) over Category 5 Unshielded Twisted-Pair (UTP) cable, but much longer for fiber connections using SFP GBIC modules.

Stacking Features

Stacking provides multiple switch management through a single point as if all stack masters are a single unit. All stack masters are accessed through a single IP address through which the stack is managed. The stack is can be managed from the following:

- Web-based Interface
- SNMP Management Station

Devices support stacking up to six units per stack, or can operate as stand-alone units. Up to 192 10/100 ports are supported in a stack.

During the Stacking setup, the switches will auto-select one as the Stacking Master. All other devices are named as slave stack members, and assigned a unique Unit ID. One of the slave units is designated as the backup master. The backup master acts as a slave stack master, but can become a stack master in the event of failure of stack master. The master and backup master are assigned unit IDs of 1 and 2. The Stack Master provides a Single point of control and management as well as a single interface in which to control and manage the stack.

Switch software is downloaded separately for each stack members. However, all units in the stack must be running the same software version.

A stack unit can operate in one of the following Modes:

- Stand-alone—the unit runs as a general switch and does not run the stacking application.
- Master Unit—manages the Stack and is responsible for the configuration.
- Master-Backup—runs as a slave unit and monitors the operation of the stack master. If the master unit fails, you must select the Master-Backup manually to assume the Stack-master role. If a Master-Backup becomes the Master Unit, another Master-Backup will need to be selected manually. One of the Slave units will not automatically become a Master-Backup.
- Slave—runs a slave version of the Switching Algorithm, which allows the applications running on the master unit to control the resources of the slave unit.

Other Features

The following list identifies the key features of the NETGEAR Smart Switch.

- 24/48 RJ-45 10/100M auto sensing Fast Ethernet switching ports.
- 2-Port 10/100/1000M auto sensing Gigabit Ethernet switching ports. These ports are reserved for stacking units together, but can be configured as user ports.
- 2 Small Form-factor Pluggable (SFP) GBIC slots which function as combo ports. Combo ports are single ports with two physical connections, SFP fiber and RJ-45 copper. The RJ-45 copper ports corresponding to the Combo ports are the last 2 10/100/1000M auto sensing Fast Ethernet switching ports on each device. If both devices are plugged in, the fiber connection is active, with fiber port taking priority if both are connected.
- FS700TS devices support full Netgear Smart Switch function.
- FS700TS devices provide full compatibility with IEEE standards:
 - IEEE 802.3i, (10BASE-T)
 - IEEE 802.3u (100BASE-TX)
 - IEEE 802.3x (Full-duplex flow control)
 - IEEE 802.3ab (1000BASE-T)
 - IEEE 802.3z (1000BASE-X)
- Auto-sensing and auto-negotiating capabilities for all ports.
- Automatic address learning function to build the packet-forwarding information table. The table contains up to 8K media access control (MAC) addresses.
- Full- and Half-duplex functions for all 10/100Mbps ports.
- Store-and-Forward transmission to remove bad packets from the network.
- Full-duplex IEEE 802.3x pause frame flow control.
- Active flow control to minimize packet loss/frame drops.
- Half-duplex back-pressure control.
- Per port LEDs, Power supply LED, Master LED and Stack ID indication.
- Internal power supply.
- Standard 1U high, rack mountable 17" chassis.

Application Example—Desktop Switching

Your NETGEAR Smart Switch is designed to provide flexibility in configuring your network connections. It can be used as a stand-alone device or with 10 Mbps, 100 Mbps, 10/100 Mbps, and 1000 Mbps hubs and switches. For example, the NETGEAR Smart Switch can be used as desktop switch to build a small network that enables users to have 1000 Mbps access to a file server.

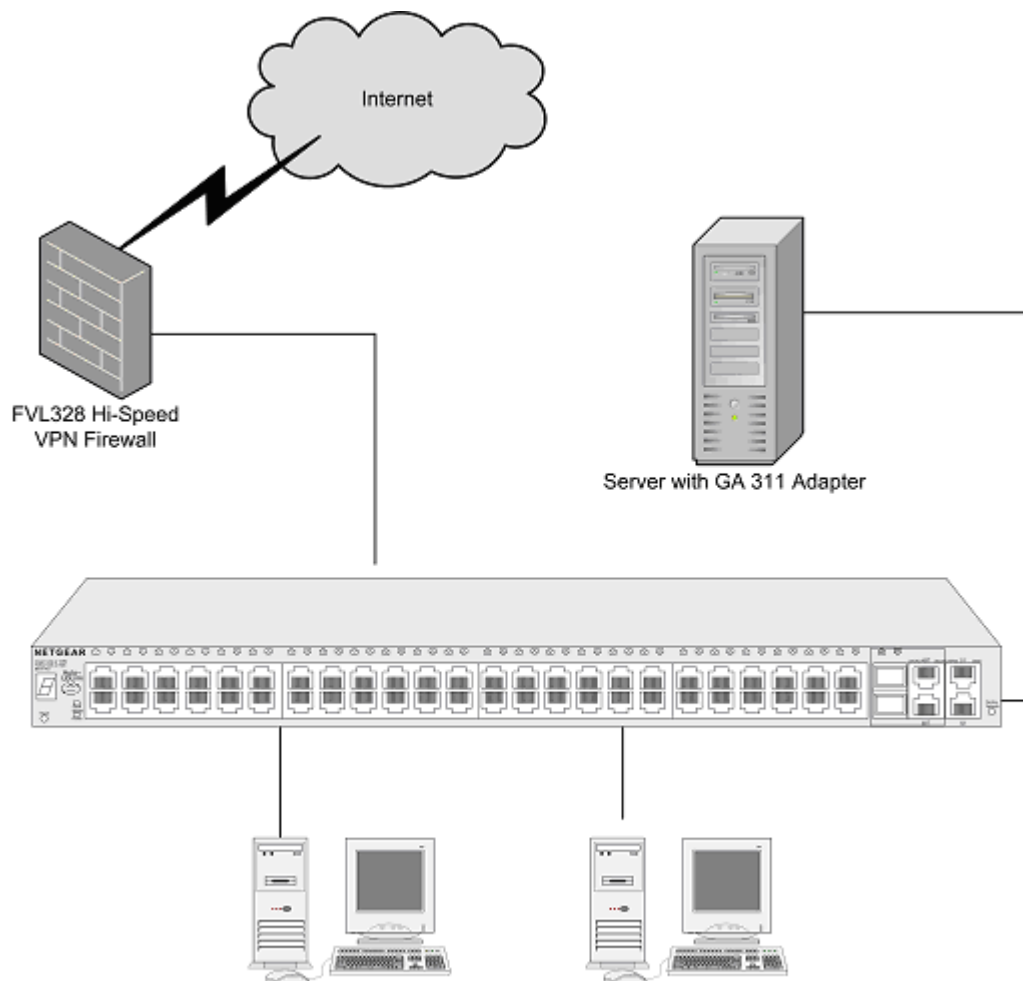


Figure 2-1

With full-duplex enabled, the switch port connected to the server or PC can provide 2000 Mbps throughput.

Package Contents

The following illustration shows the package contents of the NETGEAR Smart Switch.

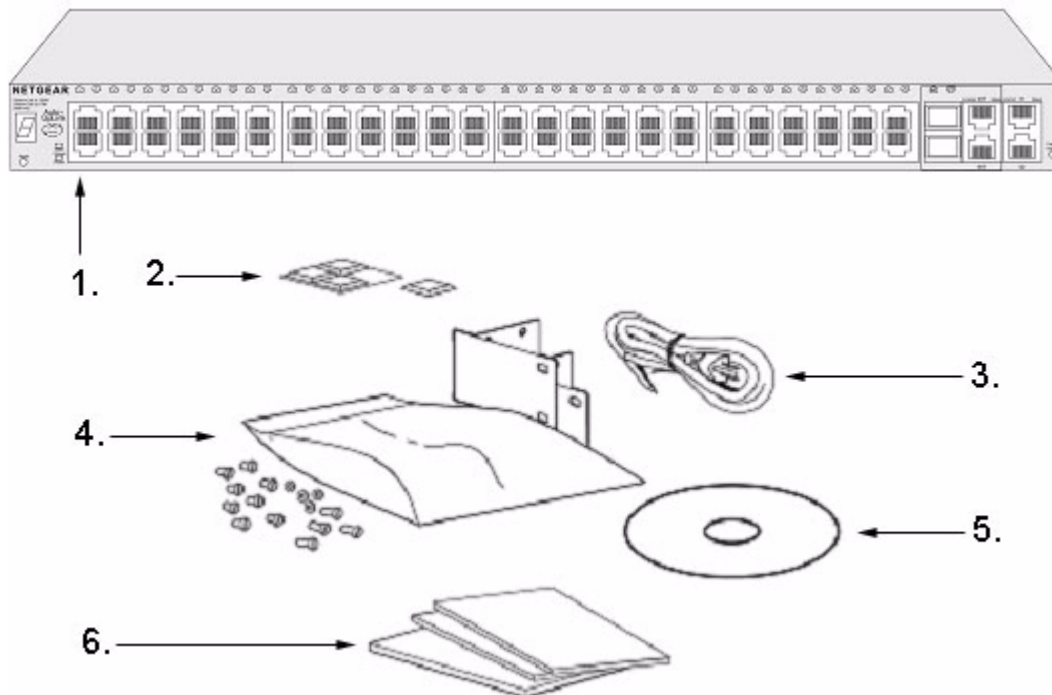


Figure 2-2

Verify that the package contains the following:

1. NETGEAR Smart Switch
2. Rubber footpads for tabletop installation
3. Power cord
4. Rack-mount kit for installing the switch in a 19-inch rack
5. Smart Switch Resource CD with Smart Wizard Discovery and User's manual
6. Documentation including installation guide and warranty/support information card

If any item is missing or damaged, contact the place of purchase immediately.

Panel Layout Guide

FS728TS Front Panel

The NETGEAR FS728TS Smart Switch is a 24-Port 10/100M Stackable Smart Switch with 4 Gigabit Ports. Each RJ45 port automatically senses the line speed and negotiates duplex mode operation with the link partner.

The following figure shows the NETGEAR FS728TS Smart Switch front panel:

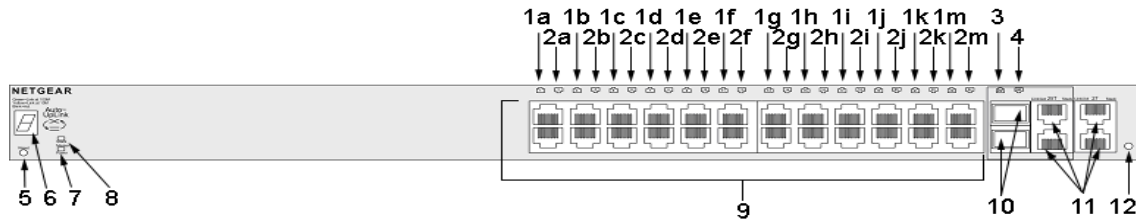


Figure 2-3

1. (1a-1m) LEDs for the top row of 10/100M ports (odd-numbered ports 1-23)
2. (2a-2m) LEDs for the bottom row of 10/100M ports (even-numbered ports 2-24)
3. LED for the top-most SFP port (port 25F)
4. LED for the bottom-most SFP port (port 26F)
5. Reset button
6. Stack ID LED
7. Power LED
8. Stack Master LED
9. 24 RJ-45 connectors for 10BASE-T and 100BASE-TX (ports 1-24)
10. 2 Gigabit Interface Converter SFP slots for SFP modules (ports 25F and 26F)
11. 4 RJ-45 connectors for 10BASE-T, 100BASE-TX and 1000BASE-T (ports 25T, 26T, 27, and 28)
12. Factory Defaults button

FS752TS Front Panel

The NETGEAR FS752TS Smart Switch is a 48-Port 10/100M Stackable Smart Switch with 4 Gigabit Ports. Each RJ45 port automatically senses the line speed and negotiates duplex mode operation with the link partner.

The following figure shows the NETGEAR FS752TS Smart Switch front panel:

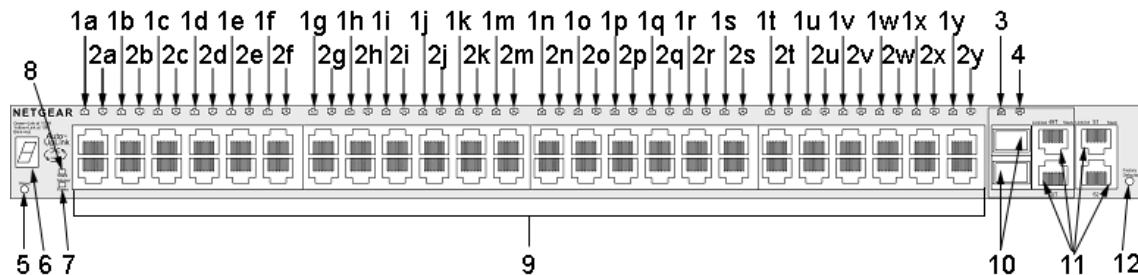


Figure 2-4

1. (1a-1y) LEDs for the top row of 10/100M ports (odd-numbered ports 1-47)
2. (2a-2y) LEDs for the bottom row of 10/100M ports (even-numbered ports 2-48)
3. LED for the top-most SFP port (port 49F)
4. LED for the bottom-most SFP port (port 50F)
5. Reset button
6. Stack ID LED
7. Power LED
8. Stack Master LED
9. 24 RJ-45 connectors for 10BASE-T and 100BASE-TX (ports 1-48)
10. 2 Gigabit Interface Converter SFP slots for SFP modules (ports 49F and 50F)
11. 4 RJ-45 connectors for 10BASE-T, 100BASE-TX and 1000BASE-T (ports 49T, 50T, 51, and 52)
12. Factory Defaults button

FS752TPS Front Panel

The NETGEAR FS752TPS Smart Switch is a 48-Port 10/100M and PoE Stackable Smart Switch with 4 Gigabit Ports. Each RJ45 port automatically senses the line speed and negotiates duplex mode operation with the link partner. The device also offers 24 PoE (Power over Ethernet) enabled ports.

The following figure shows the NETGEAR FS752TPS Smart Switch front panel:

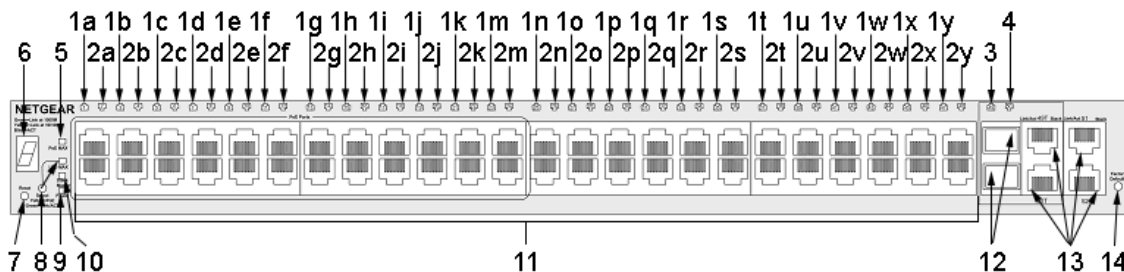


Figure 2-5

1. (1a-1y) LEDs for the top row of 10/100M ports (odd-numbered ports 1-47)
2. (2a-2y) LEDs for the bottom row of 10/100M ports (even-numbered ports 2-48)
3. LED for the top-most SFP port (port 49F)
4. LED for the bottom-most SFP port (port 50F)
5. PoE Max LED
6. Stack ID LED
7. Reset button
8. Port 1-24 Mode Select button and LED
9. Power LED
10. Stack Master LED
11. 24 RJ-45 connectors for 10BASE-T and 100BASE-TX (ports 1-48)
12. 2 Gigabit Interface Converter SFP slots for SFP modules (ports 49F and 50F)
13. 4 RJ-45 connectors for 10BASE-T, 100BASE-TX and 1000BASE-T (ports 49T, 50T, 51, and 52)
14. Factory Defaults button

LED Designations

Port LEDs

The following table describes the port LED designations.

Table 1. Port LEDs Non-POE Device

Table 2-1. PORT LEDs on Non-PoE Devices

Port	LED	Designation
24/48 10/100M Ports—One LED/Port	Link/ACT/SPD LED	Off : No 10/100Mbps link is established on the port. Solid Green : A valid 100Mbps link is established on the port. Flashing Green : Packet transmission or reception is occurring on the port at 100Mbps. Solid Yellow : A valid 10Mbps link is established on the port. Flashing Yellow : Packet transmission or reception is occurring on the port at 10Mbps.
4 Gigabit Copper Ports—Two LED's/Port on Jack	Left LED Link/ACT/SPD LED:	Off : No 10/100/1000Mbps link is established on the port. Solid Green : A valid 1000Mbps link is established on the port. Solid Yellow : A valid 10/100Mbps link is established on the port. Flashing Green : Packet transmission or reception is occurring on the port at 1000Mbps. Flashing Yellow : Packet transmission or reception is occurring on the port at 10/100Mbps.
	Right LED Stack LED (Combo port group/Copper port group):	Green : Stack port has a valid link connection. Off : Stack port does not have a valid link connection.
2 SFP Ports—One LED/Port	SFP Link/ACT LED	Off : No link is established on the port. Solid Green : A valid link is established on the port. Flashing Green : Packet transmission or reception is occurring on the port.

Table 2-2. Port LEDS on PoE Devices

Port	LED	Designation
48 10/100M Ports—One LED/Port (Ethernet Mode)	Link/ACT/SPD LED	<p>Off: No 10/100Mbps link is established on the port.</p> <p>Solid Green: A valid 100Mbps link is established on the port.</p> <p>Flashing Green: Packet transmission or reception is occurring on the port at 100Mbps.</p> <p>Solid Yellow: A valid 10Mbps link is established on the port.</p> <p>Flashing Yellow: Packet transmission or reception is occurring on the port at 10Mbps.</p>
24 10/100M Ports—One LED/Port (PoE Mode)	POE Indicate LED/POE fault	<p>Solid Green: The PoE powered device (PD) is connected and the port is supplying power successfully.</p> <p>Solid Yellow: Indicates one of the following failures resulted in stopping power to that port:</p> <ul style="list-style-type: none"> • Short circuit on PoE power circuit • PoE power demand exceeds power available • PoE current exceeds PD's classification • Out of proper voltage band (44 ~ 57 VDC) <p>Off: No PoE powered device (PD) connected.</p> <p>Note: PoE mode is only available on the leftmost 24 of the 10/100M ports (ports 1-24).</p>
4 Gigabit Copper Ports—Two LED's/Port on Jack	Left LED Link/ACT/SPD LED:	<p>Off: No 10/100/1000Mbps link is established on the port.</p> <p>Solid Green: A valid 1000Mbps link is established on the port.</p> <p>Solid Yellow: A valid 10/100Mbps link is established on the port.</p> <p>Flashing Green: Packet transmission or reception is occurring on the port at 1000Mbps.</p> <p>Flashing Yellow: Packet transmission or reception is occurring on the port at 10/100Mbps.</p>
2 SFP Ports—One LED/Port	SFP Link/ACT LED	<p>Off: No link is established on the port.</p> <p>Solid Green: A valid link is established on the port.</p> <p>Flashing Green: Packet transmission or reception is occurring on the port.</p>

System LEDs

The following table describes the system LED designations.

Table 2-3. System LEDs

LED	Designation
Port 1-24 Mode LED	Solid Green: Ethernet LED Mode (default) Solid Yellow: PoE LED Mode
Stack ID LED—One 7-segment LED Display	Green: Displays Stack ID (1-6).
Stack Master LED	Solid Green: Switch acts as a master unit in a stack of switches. The Stack Master LED is lit if there is an active stack link, and the unit is in stack mode. Off: Switch acts as a slave unit in a stack of switches.
Power LED	Solid Green: Power is supplied to the switch and is operating normally. Off: Power is disconnected.
MAX POE LED	Solid Yellow: Indicates less than 7W of PoE power is available. Flashing Yellow: Indicates the PoE MAX LED was active in the previous two minutes. Off: There is at least 7W of PoE power available for another device

Front Panel Buttons

Reset Button

The Smart Switch has a Reset Button to trigger a hardware reset of the switch. This is equivalent to turning the power off and back on. The last saved configuration will be loaded onto the switch as it resets. The LEDs on the switch should go out and then come back on as the switch goes through its Power On Switch Test (POST).

Factory Defaults Button

The Smart Switch has a Factory Default Button to enable the clearing out of the current configuration and returning the device back to the factory settings. This will remove all settings, including the password, VLAN settings and port configurations. If the switches are in a stack, the stacking settings are cleared by the Factory Defaults Button.

Port 1-24 Mode Select (FS752TPS only)

See Port 1-24 Mode LED description in [Table 2-3](#).

Device Hardware Interfaces

RJ-45 Ports

RJ-45 ports are auto-sensing ports. When inserting a cable into an RJ-45 port, the switch automatically ascertains the maximum speed (10 or 100 or 1000 Mbps) and duplex mode (half- or full-duplex) of the attached device. All ports support only unshielded twisted-pair (UTP) cable terminated with an 8-pin RJ-45 plug.

To simplify the procedure for attaching devices, all RJ-45 ports support Auto Uplink. This technology allows attaching devices to the RJ-45 ports with either straight-through or crossover cables. When inserting a cable into the switch's RJ-45 port, the switch automatically:

- Senses whether the cable is a straight-through or crossover cable.
- Determines whether the link to the attached device requires a "normal" connection (such as when connecting the port to a PC) or an "uplink" connection (such as when connecting the port to a router, switch, or hub).
- Configures the RJ-45 port to enable communications with the attached device, without requiring user intervention. In this way, the Auto Uplink technology compensates for setting uplink connections, while eliminating concern about whether to use crossover or straight-through cables when attaching devices.

SFP GBIC Module

The GBIC module bays accommodate standard SFP GBIC modules, such as the AGM731F, AGM732F, or AGM733 from NETGEAR, allowing fiber connections on the network. The module bay is a combo port, sharing a connection with an RJ-45 port. Being a combo port, only one type of connection can be active at any given time. For example, both copper and fiber port cannot be used at the same time. If both connectors are plugged in at the same time, the fiber port will be active.

The SFP GBIC bay accommodates a standard SFP GBIC module.

Chapter 3

Installation

This chapter describes the installation procedures for your NETGEAR Smart Switch. Switch installation involves the following steps:

Step 1: Preparing the site

Step 2: Installing the switch

Step 3: Checking the installation

Step 4: Connecting devices to the switch

Step 5: Installing an SFP GBIC module

Step 6: Installing device as stand-alone or stack master

Step 7: Apply AC power

Step 8: Switch management through a Web Brower or the PC Utility for initial configuration

Step 1: Preparing the Site

Before you installing the switch, ensure the operating environment meets the operating environment requirements in the following table.

Table 3-1. Site Requirements

Characteristics	Requirements
Mounting	Desktop installations: Provide a flat table or shelf surface. Rack-mount installations: Use a 17-inch (48.3-centimeter) EIA standard equipment rack that is grounded and physically secure. The rack-mount kit supplied with the switch is also required.
Access	Locate the switch in a position that allows access to the front panel RJ-45 ports, view the front panel LEDs, and access power connector.

Table 3-1. Site Requirements (continued)

Characteristics	Requirements
Power source	Provide a power source within 6 feet (1.8 meters) of the installation location. Power specifications for the switch are shown in Appendix C. Ensure the AC outlet is not controlled by a wall switch, which can accidentally turn off power to the outlet and the switch.
Environmental	Temperature: Install the switch in a dry area, with ambient temperature between 0 and 50°C (32 and 122°F). Keep the switch away from heat sources such as direct sunlight, warm air exhausts, hot-air vents, and heaters. Operating humidity: The installation location should have a maximum relative humidity of 90%, non-condensing. Ventilation: Do not restrict airflow by covering or obstructing air inlets on the sides of the switch. Keep at least 2 inches (5.08 centimeters) free on all sides for cooling. Be sure there is adequate airflow in the room or wiring closet where the switch is installed. Operating conditions: Keep the switch at least 6 ft (1.83 m) away from nearest source of electromagnetic noise, such as a photocopy machine.

Step 2: Installing the Switch

The NETGEAR Smart Switch can be installed on a flat surface or in a standard 19-inch rack.

Installing the Switch on a Flat Surface

The switch ships with four self-adhesive rubber footpads. Stick one rubber footpad on each of the four concave spaces on the bottom of the switch. The rubber footpads cushion the switch against shock/vibrations. They also provide space between each stacked switch for ventilation.

Installing the Switch in a Rack

To install the switch in a rack, use the following procedure (and see [Figure 3-1](#)). To perform this procedure, the 19-inch rack-mount kit supplied with switch is required.

1. Attach the supplied mounting brackets to the side of the switch.
2. Insert the screws provided in the rack-mount kit through each bracket and into the bracket mounting holes in the switch.
3. Tighten the screws with a #1 Phillips screwdriver to secure each bracket.
4. Align the mounting holes in the brackets with the holes in the rack, and insert two pan-head screws with nylon washers through each bracket and into the rack.

5. Tighten the screws with a #2 Phillips screwdriver to secure the switch in the rack.

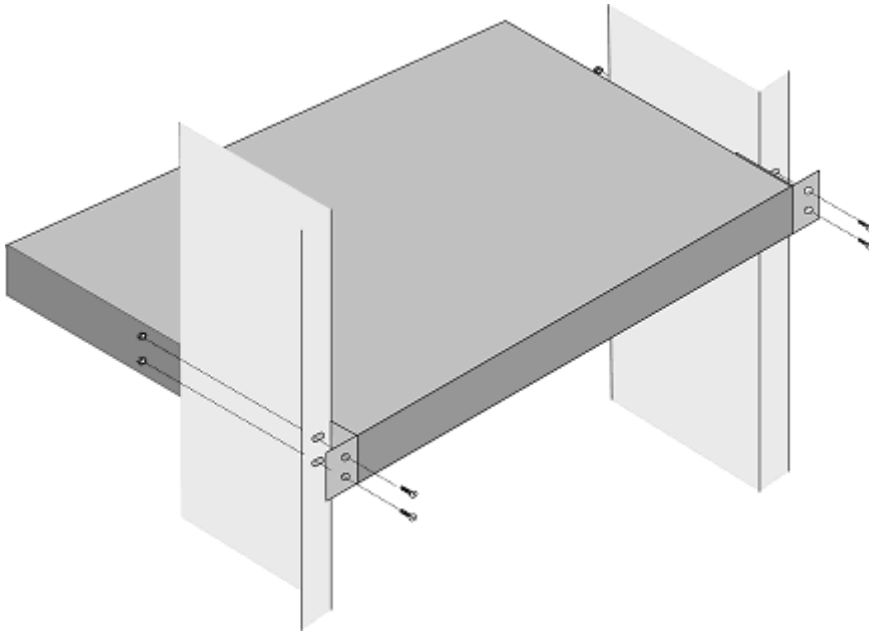


Figure 3-1

Step 3: Checking the Installation

Before applying power check the following:

1. Inspect the equipment thoroughly.
2. Verify that all cables are installed correctly.
3. Check cable routing to make sure cables are not damaged or creating a safety hazard.
4. Ensure all equipment is mounted properly and securely.

Step 4: Connecting Devices to the Switch

The following procedure describes how to connect PCs to the switch's RJ-45 ports. The NETGEAR Smart Switch contains Auto Uplink™ technology, which allows the attaching of devices using either straight-through or crossover cables.

Connect each PC to an RJ-45 network port on the Switch front panel, as shown in the diagram below. Use Category 5 (Cat5) unshielded twisted-pair (UTP) cable terminated with an RJ-45 connector to make these connections.

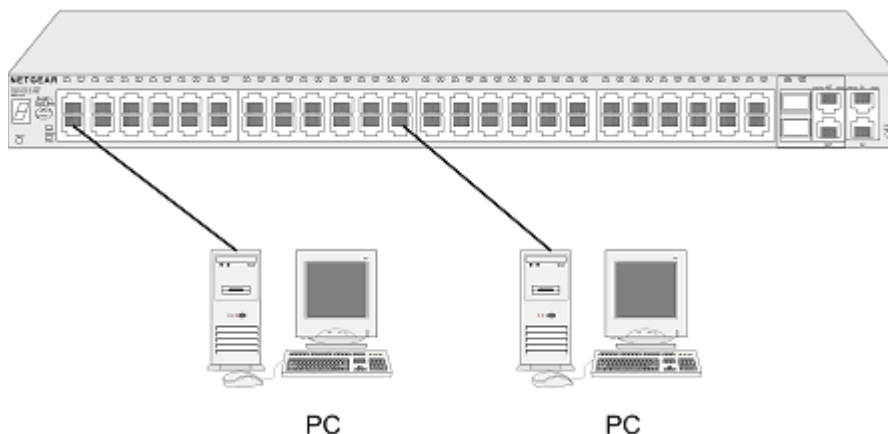


Figure 3-2



Note: Ethernet specifications limit the cable length between the switch and the attached device to 100 m (328 ft).

Step 5: Installing an SFP GBIC Module

The following procedure describes how to install an SFP Gigabit Ethernet module in the switch's Gigabit module bay. Standard SFP GBIC modules are sold separately from the Smart Switch. If an SFP GBIC module is not being installed at this time, skip this procedure.

To install an SFP GBIC module:

1. Insert the SFP module into the SFP module bay.

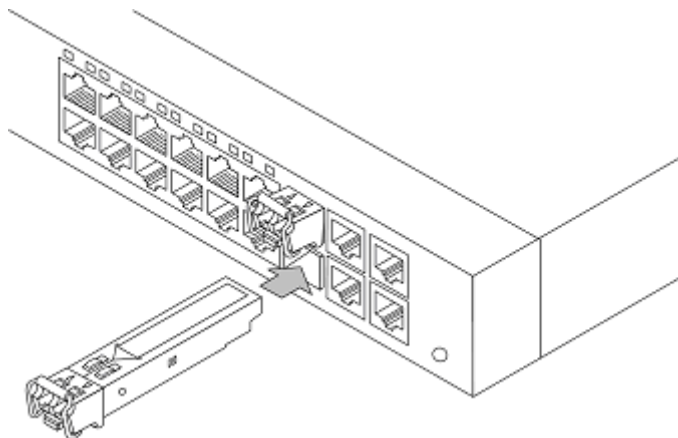


Figure 3-3

2. Press firmly to ensure the module seats into the connector.

Step 6: Installing Device as Stand-alone or Stack Master

The device can operate as a stand-alone device, or part of a stack. By default the device is in stack mode. Changing the mode is possible through the switch's web page once the device has been booted and is operational.

The default port for connecting the devices in a stack is the Gigabit copper port. The fiber port can also be used for stacking. Enabling the fiber port to be used for stacking, is through the switch's web page once the device has been booted and is operational.

There are two stacking topologies supported by the device, the Ring topology or Chain topology.

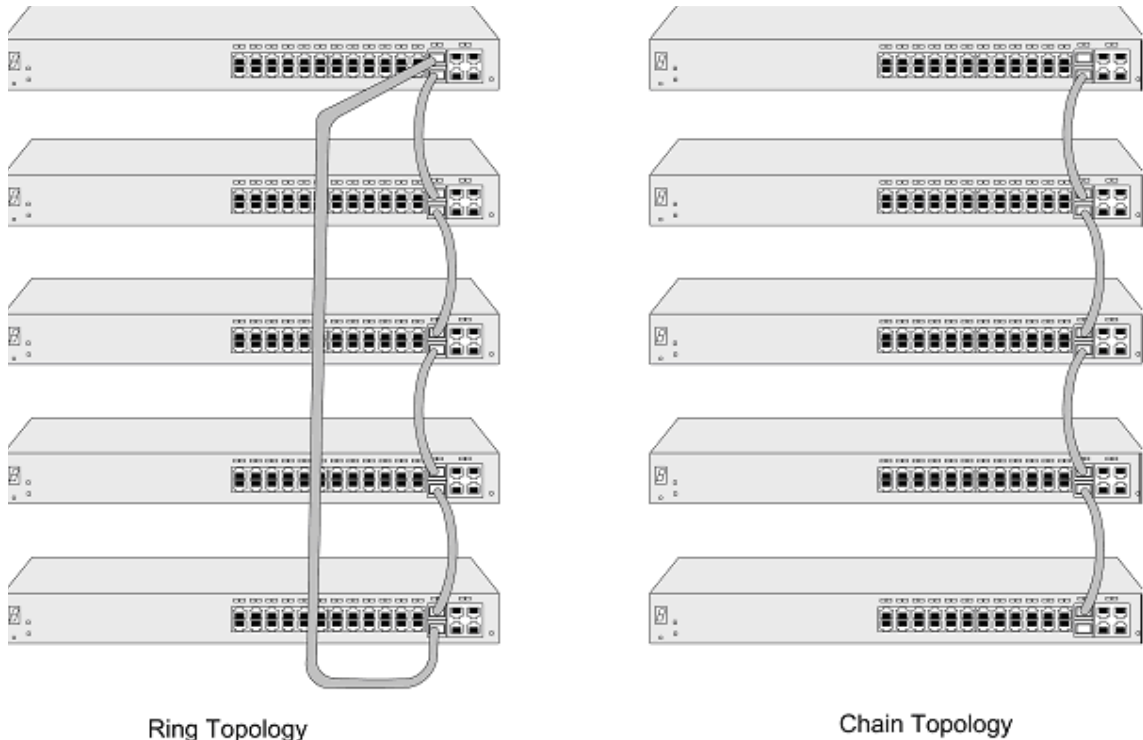


Figure 3-4

The device is “Plug and Play” in terms of stacking configuration. Before powering up the device, connect the devices into the required stacking topology. Power up the devices. The stacking Master and slave designations are configured through automatic discovery. Manually changing the stacking configuration is through switch's web page once the device has been booted and is operational.

For more information on stacking see the NETGEAR Prosafe Stackable Smart Switch User Guide.

Step 7: Applying AC Power

NETGEAR Smart Switch does not have an ON/OFF switch. The method of applying or removing AC power is by connecting or disconnecting the power cord. Before connecting the power cord, select an AC outlet that is not controlled by a wall switch, which can turn off power to the switch. After selecting an appropriate outlet, use the following procedure to apply AC power.

1. Connect the female end of the supplied AC power adapter cable to the power receptacle on the back of the switch.
2. Connect the 3-pronged end of the AC power adapter cable to a grounded 3-pronged AC outlet.

When applying power, the Power LED on the switch's front panel is Green.

If the Power LED does not go on, check that the power cable is plugged in correctly and that the power source is good. If this does not resolve the problem, see [Chapter 4, “Troubleshooting”](#).

Step 8: Switch Management through a Web Browser or the PC Utility for Initial Configuration

The NETGEAR Smart Switch contains software for viewing, changing, and monitoring the way it works. This management software is not required for the switch to work. The ports can be used without using the management software. However, the management software enables the setup of VLAN and Trunking features, and also improves the efficiency of the switch, which results in the improvement of its overall performance as well as the performance of the network.

After powering up the switch for the first time, the Smart Switch can be configured using a Web browser or a utility program called Smart Wizard Discovery. For more information about managing the switch, see the Software Manual on the Smart Switch Resource CD.

Chapter 4

Troubleshooting

This chapter provides information about troubleshooting the NETGEAR Smart Switch. Topics include the following:

- Troubleshooting chart
- Additional troubleshooting suggestions

Troubleshooting Chart

The following table lists symptoms, causes, and solutions of possible problems.

Table 4-1. Troubleshooting Chart

Symptom	Cause	Solution
Power LED is off.	No power is received.	Check the power cord connections for the switch at the switch and the connected device. Ensure all cables used are correct and comply with Ethernet specifications.
Link LED is off or intermittent.	Port connection is not working.	Check the crimp on the connectors and make sure that the plug is properly inserted and locked into the port at both the switch and the connecting device. Ensure all cables used are correct and comply with Ethernet specifications. See Appendix D. Check for a defective adapter card, cable, or port by testing them in an alternate environment where all products are functioning.
File transfer is slow or performance degradation is a problem.	Half- or full-duplex setting on the switch and the connected device are not the same.	Make sure the attached device is set to auto-negotiate.
A segment or device is not recognized as part of the network.	One or more devices are not properly connected, or cabling does not meet Ethernet guidelines.	Verify that the cabling is correct. Ensure all connectors are securely positioned in the required ports. Equipment may have been accidentally disconnected.

Table 4-1. Troubleshooting Chart (continued)

Symptom	Cause	Solution
ACT LED is flashing continuously on all connected ports and the network is disabled.	A network loop (redundant path) has been created.	Break the loop by ensuring that there is only one path from any networked device to any other networked device.
A unit is linked to a stack, but does not join the stack.	The stacking ports of the new unit are configured differently from the stack, or the unit is configured as a stand-alone unit.	Remove the unit from the stack. If the stack links are copper links, push the "Restore to Default" button. If the stack links are combo links, use the Web Management to configure the unit as a stackable unit, with combo links used as the stacking ports.

Additional Troubleshooting Suggestions

If the suggestions in Troubleshooting Chart do not resolve the problem, refer to the troubleshooting suggestions in this section.

Network Adapter Cards

Ensure the network adapter cards installed in the PCs are in working condition and the software driver has been installed.

Configuration

If problems occur after altering the network configuration, restore the original connections and determine the problem by implementing the new changes, one step at a time. Ensure that cable distances, repeater limits, and other physical aspects of the installation do not exceed the Ethernet limitations.

Switch Integrity

If required, verify the integrity of the switch by resetting the switch. To reset the switch, remove the AC power from the switch and then reapply AC power. If the problem continues, contact NETGEAR technical support. In North America, call 1-888-NETGEAR. If you are outside of North America, please refer to the support information card included with your product.

Auto-negotiation

The RJ-45 ports negotiate the correct duplex mode and speed if the device at the other end of the link supports auto negotiation. If the device does not support auto negotiation, the switch only determines the speed correctly and the duplex mode defaults to half-duplex.

The gigabit port on the Gigabit module negotiates speed, duplex mode, and flow control, provided that the attached device supports auto-negotiation.

Appendix A

Technical Specifications

Network Protocol and Standards Compatibility

IEEE 802.3ab 1000BASE-T
IEEE 802.3ad
IEEE 802.3af Power over Ethernet (FS752TPS only)
IEEE 802.3z 1000Base-X
IEEE 802.3x flow control
IEEE 802.1x
IEEE 802.1D
IEEE 802.3 10BASE-T
IEEE 802.3u 100BASE-TX

Management

IEEE 802.1Q Static VLAN (Up to 128 ranging from 2 to 4K)
IEEE 802.1p Class of Service (CoS)
Port-based QoS
Port Trunking LACP

Interface Specifications

24 RJ-45 connectors (on FS728TS model) or 48 RJ-45 connectors (on FS752TS and FS752TPS models) for 10BASE-T, 100BASE-TX (Auto Uplink™ on all ports)
4 RJ-45 connectors for 10BASE-T, 100BASE-TX and 1000BASE-T, two are dedicated and two are shared with SFP slots
2 SFP GBIC slots for standards-based SFP GBIC for modules

LEDs

Per port (10/100 and Gigabit): Link/Activity, Speed
Per port (Gigabit only): Stack
Per device: Power, Stack Master, Unit Number

Performance Specifications:

Forwarding modes:	Store-and-forward
Bandwidth:	12.8 Gbps (for FS728TS) / 17.6 Gbps
Address database size:	8,000 media access control (MAC) addresses per system
Mean Time Between Failure (MTBF):	100,000 hours (~11 years) for FS728TS; 84,000 hours (~ 9.5 years) for FS752TS; TBD for FS752TPS.

Power Supply

Power consumption: 15 W maximum; 225 W maximum for FS752TPS
AC Supply: 100-240VAC/50-60 Hz universal input

Physical Specifications

Dimensions (H x W x D): FS728TS and FS752TS:
1.7" x 17.32" x 8.07"
43.2 mm x 440 mm x 205 mm
FS752TPS:
1.7" x 17.32" x 10.12"
43.2 mm x 440 mm x 257 mm
Weight: FS728TS: 5.73 lbs, FS752TS: 6.57 lbs, FS752TPS: 8.92 lbs
FS728TS: 2.6 kg, FS752TS: 2.98 kg FS752TPS: 4.05 kg

Environmental Specifications

Operating temperature: 0° to 50° C (32° to 122° F)
Operating humidity: 90% maximum relative humidity, noncondensing
Storage humidity: 95% maximum relative humidity, noncondensing
Operating altitude: 3,000 m (10,000 ft) maximum
Storage altitude: 3,000 m (10,000 ft) maximum

Electromagnetic Emissions

Meets requirements of: CE mark, commercial
FCC Part 15 Class A
VCCI Class A
C-Tick

Electromagnetic Immunity

EN 55022 (CISPR 22), Class A

Safety

Meets requirements of: CE mark, commercial
UL listed (UL 1950) / cUL IEC950 / EN60950

Modules

AGM731F 1000BASE-SX SFP GBIC for multimode fiber
AGM732F 1000BASE-LX SFP GBIC for single mode fiber
AGM733 1000BASE-LZ GBIC for long haul single mode fiber

Appendix B

Related Documents

This appendix provides links to reference documents you can use to gain a more complete understanding of the technologies used in your NETGEAR product.

Document	Link
Internet Networking and TCP/IP Addressing	http://documentation.netgear.com/reference/enu/tcpip/index.htm
Wireless Communications	http://documentation.netgear.com/reference/enu/wireless/index.htm
Preparing a Computer for Network Access	http://documentation.netgear.com/reference/enu/wsdhcp/index.htm
Virtual Private Networking (VPN)	http://documentation.netgear.com/reference/enu/vpn/index.htm
Glossary	http://documentation.netgear.com/reference/enu/glossary/index.htm

